Quectel LG580P (03)

Full-Constellations and Multi-Bands High-Precision GNSS Module

21.0 mm · 16.0 mm · 2.7 mm
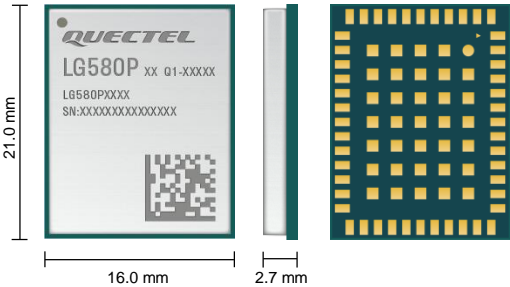
LG580P (03) is a full-constellations, multi-bands GNSS module with 1040 tracking channels, which supports concurrent reception of GPS, GLONASS, Galileo, BDS, QZSS, and NavIC constellations, as well as multiple SBAS systems (WAAS, EGNOS, BDSBAS, MSAS, GAGAN, KASS, ASECNA, SouthPAN, and SDCM).

The built-in professional-grade interference signal detection and elimination algorithms effectively mitigate multiple narrow-band interferences, which significantly improves signal reception performance, particularly in complex electromagnetic environments. In addition, LG580P (03) supports multi-band signals L1, L2, L5, L6 and features built-in RTK + Heading algorithms, significantly enhancing robustness in challenging environments such as dense foliage canopy and urban canyons, enabling high-precision positioning capabilities.

LG580P (03) supports integrity information detection functions such as protection level to assist control decision-making in applications like autonomous navigation. It also features on-chip memory ECC verification and Secure Boot loading mechanisms, providing additional firmware security. In addition, it offers versatile peripheral interfaces including UART, SPI*, I2C*, and CAN* to meet diverse application requirements.

With high precision, low power consumption and a high positioning and heading update rate of up to 20 Hz, LG580P (03) is an ideal choice for high-precision navigation applications, such as intelligent robots, precision agriculture, ADAS, and autonomous driving.

Key Features

- ✔ Concurrent reception of multi-constellation signals: GPS, GLONASS, Galileo, BDS, QZSS, NavIC and SBAS
- ✔ Multi-band GNSS signals: L1, L2, L5 and L6
- ✔ High positioning and heading update rate of up to 20 Hz
- ✔ Built-in professional-grade NIC anti-jamming unit to suppress multiple narrow-band interferences
- ✔ Abundant interfaces: UART, SPI*, I2C* and CAN*
- ✔ AGNSS* technology

Multi-constellation	Multi-band	Low Power Consumption
Tracking Sensitivity: -160 dBm	Operating Temperature Range: -40 °C to +85 °C	Anti-jamming
RoHS Compliant	Ultracompact Size	AGNSS Technology

GNSS Module	LG580P (03)
Dimensions	21.0 mm × 16.0 mm × 2.7 mm
Weight	Approx. 1.4 g
Temperature Range	
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +95 °C
GNSS Features	
Supported Bands **(Primary and Secondary Antennas①)**	GPS: L1 C/A, L2C, L5 GLONASS: L1, L2 Galileo: E1, E5a, E5b, E6 BDS: B1I, B1C, B2I, B2a, B2b, B3I QZSS: L1 C/A, L2C, L5, L6 NavIC: L5
Default Constellations	GPS + GLONASS + Galileo + BDS + QZSS + NavIC
Number of Tracking Channels	1040
SBAS	WAAS, EGNOS, BDSBAS, MSAS, GAGAN, KASS, ASECNA, SouthPAN, SDCM
Function	RTK + Heading
Horizontal Position Accuracy	Autonomous: 1 m② RTK: 0.8 cm + 1 ppm③
Vertical Position Accuracy	Autonomous: 1.5 m② RTK: 1.5 cm + 1 ppm③
Velocity Accuracy④	Without Aid: 0.03 m/s
1PPS Signal Accuracy (1σ)④	5 ns
RTK Convergence Time③	5 s
Heading Accuracy⑤	0.1˚
TTFF (without AGNSS*)⑥	Cold Start: 28 s Warm Start: 28 s Hot Start: 1.8 s
Sensitivity (@ Default Constellations)⑦	Acquisition: -145 dBm Tracking: -160 dBm Reacquisition: -155 dBm
Dynamic Performance④	Maximum Altitude: 10000 m Maximum Velocity: 490 m/s Maximum Acceleration: 4g
Update Rate	Default: 10 Hz Max.: 20 Hz
Certifications	
Regulatory	**Europe**: CE*
Others	RoHS
Interfaces	
UART	× 3 Adjustable: 9600-3000000 bps Default: 460800 bps
I2C*	× 1 Max. 400 kbps
SPI*	× 1 Recommended baud rate range: 1-3 Mbps
CAN*	× 1 (Multiplexed from UART3)
Protocols	
Protocol	NMEA 0183, RTCM 3.x and QGC
Antenna Interface	
Antenna Type	External active antenna⑧
Antenna Power Supply	External
Electrical Characteristics	
Supply Voltage Range	3. 0–3.6 V, Typ. 3.3 V
I/O Voltage	Typ. 3.3 V
Current Consumption④ **(@ 3.3 V, Default Constellations)**	**Normal Operation:** 98 mA (323.4 mW) @ Acquisition 116 mA (382.8 mW) @ Tracking **Power Saving Mode:** 18 µA (59.4 µW) @ Backup Mode

NOTE:

*: Under development/ in progress.
① The secondary antenna does not support GLONASS L1 and L2, Galileo E6, BDS B3I and QZSS L6.
② Tested under CEP 50% in static open-sky conditions over 24 hours.
③ Tested under CEP 50% in open-sky conditions using high-precision active GNSS antennas, with baseline lengths maintained below 1 km.
④ Tested at 25 °C ambient temperature under typical operating voltage, with satellite signals set to -130 dBm using test instruments.
⑤ Standard deviation value obtained under static conditions in open-sky conditions with a baseline length of 1 meter.
⑥ Tested at 25 °C under typical operating voltage in open-sky conditions.
⑦ Tested using two external LNAs (18.5 dB gain, 0.85 dB noise figure), with minimum tracked satellites: GPS L1 +L5 ≥12, BDS B1I + B2a ≥10, Galileo E1 + E5a ≥10.
⑧ To mitigate the impact of out-of-band interference on GNSS module performance, active antennas with the SAW filter placed in front of the LNA must be used. DO NOT use active antennas where the LNA is placed in front of the SAW filter.

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